

What is claimed is:

1. A flexible belt seam treatment apparatus comprising:
a support element with a smooth surface arranged to support a belt seam region;
a belt hold system that holds the belt seam region against the support element; and
a heated pressure element arranged to heat and force a belt seam region against the support element.
2. The apparatus of claim 1 wherein the smooth surface supporting the belt is substantially flat.
3. The apparatus of claim 1 wherein the smooth surface comprises an adhesive coating.
4. The apparatus of claim 3 wherein the adhesive coating comprises a fluoropolymer.
5. The apparatus of claim 1 wherein the heated pressure element comprises a heated pressure bar.
6. The apparatus of claim 5 wherein the heated pressure bar exerts from about 70 lbs/in² to about 770 lbs/in² compression force.
7. The apparatus of claim 1 wherein the heated pressure element comprises a heated pressure wheel.
8. The apparatus of claim 7 wherein the heated pressure wheel exerts from about 1 lb/in to about 20 lb/in line contact force.

9. The apparatus of claim 1 wherein the heated pressure element includes a resistance heating element.

10. The apparatus of claim 1 wherein the heated pressure element is heated by electromagnetic induction.

11. The apparatus of claim 1 wherein a surface of the heated pressure element includes an adhesive coating.

12. A flexible belt seam treatment apparatus comprising:
a support element with a smooth surface arranged to support a belt seam region; and
a heat and pressure source arranged to heat a treatment strip applied to the belt seam region to a temperature falling in a range of from about 20°C to about 70°C above a glass transition temperature of at least one of a thermoplastic polymer of the treatment strip and a thermoplastic polymer of the belt seam region, and further arranged to exert a compression contact force on the treatment strip.

13. The apparatus of claim 12 wherein the heat and pressure source is a heated pressure bar.

14. The apparatus of claim 13 wherein the support element is tubular and the heated pressure bar has a contact surface substantially corresponding to at least an arcuate portion of the support element's surface.

15. The apparatus of claim 14 wherein the heated pressure bar exerts from about 70 lbs/in² to about 770 lbs/in² compression force on the treatment strip.

16. The apparatus of claim 12 wherein the heat and pressure source is a heated pressure wheel.

17. The apparatus of claim 16 wherein the support element is tubular and the heated pressure wheel has a contact surface substantially corresponding to at least an arcuate portion of the support element's surface.

18. The apparatus of claim 16 wherein the heated pressure wheel exerts from about 1 lb/in to about 20 lb/in line contact force on the treatment strip.

19. The apparatus of claim 12 wherein an electromagnetic induction system provides heat for the heat and pressure source.

20. The apparatus of claim 12 wherein a resistive heating element provides heat for the heat and pressure source.

21. A flexible belt seam treatment apparatus comprising:

a tube with a smooth, adhesive outer surface;

a belt hold system arranged to hold a seam region of a belt against at least a portion of the outer surface of the tube; and

a heated pressure element with a substantially concave outer surface substantially corresponding to a curvature of the at least a portion of the outer surface of the tube against which the seam region of the belt is held.

22. The apparatus of claim 21 wherein the heated pressure element is a heated pressure wheel and the apparatus further comprises an actuator that moves the heated pressure wheel across a width of the seam region.

23. The apparatus of claim 21 wherein the heated pressure element is a heated pressure bar that selectively engages an entire width of the seam region and the apparatus further comprises an actuator that moves the heated pressure bar into engagement with the seam region when the seam region is held against the tube.

24. The apparatus of claim 21 wherein the belt hold system comprises a vacuum system including at least one opening in the outer surface of the tube, a sealed end of the tube, and an unsealed end of the tube in selective fluid communication with a vacuum source.

25. The apparatus of claim 21 wherein the belt hold system includes a bar that extends through a portion of the belt farthest from the tube and selectively pulls the belt against the tube.

26. The apparatus of claim 21 wherein the bar is connected to an actuator that selectively exerts force on the belt to pull the belt against the tube.

27. The apparatus of claim 25 wherein the bar is placed in the belt by an operator and pulls the belt through the action of gravity on the bar.